

II.4-RES-SNGL-A-FLASHBDS SINGLE RESERVOIR REGULATION OPERATION SCHEME FLASH BOARDS

Description

Scheme FLASHBDS is used to specify flash boards.

Flash boards are installed on a dam to permit additional storage of water for power or water supply purposes. The boards are usually about 10 FT wide with a height normally varying from 2 to 5 FT. The boards are usually hinged to a support bar or pipe about 1/3 of the distance from the bottom of the board. Theoretically the boards should flip over and become parallel to the water flow when water overflows the top of the boards. However due to the friction in the hinges water usually overflows the boards about 0.5 to 0.6 FT above the top before any flip over (only the number of boards required to discharge the inflow will usually flip over). When the water recedes below the hinge elevation the boards automatically flip back to the vertical position and water will again be stored until overflow of the top of boards occurs.

Sometimes a few of the boards can be controlled by the operator of the dam. In this situation it is assumed that these controlled boards will be flipped over at a specified pool elevations as required to keep inflow from exceeding outflow if possible. The specified pool elevation can be determined from past records. More than one size of flash boards and different spillway crest elevations might be involved in a dam with flash boards.

Routing over a dam with flash boards requires the adjustment of inflows for turbine outflows (if a power dam) and the computation of a new routing relation whenever any additional boards flip over. This is accomplished by computing a new relation of storage (above spillway crest) versus outflow. An elevation versus discharge curve (for the number of boards down) and the elevation versus storage curve are used for these computations. A relation of storage plus outflow/2 versus outflow is then computed and routing is accomplished by the Modified Plus method.

Parameters

- (NBOARDS) - Number of boards for each size of board
- (GENL-L) - Large board specifications consisting of following values:
 1. spillway crest elevation
 2. large elevation
 3. elevation of top of boards
 4. elevation when boards flip (about 0.6 above top for most boards)
 5. length of spillway
- (RATING-L) - Spillway Rating Curve for large boards (pool elevation versus spillway discharge)

- (GENL-S) - Small board specifications - if present use same specifications as GENL-L above
- (RATING-S) - Spillway Rating Curve for small boards if present
- (GENL-G) - Gate specifications - if present consists of following values:
 1. crest elevation
 2. pool elevation where gate opens
 3. maximum gate opening
 4. number of future periods to scan for maximum inflows
- (RATING-G) - Spillway Rating Curve for gates, if present
- (RELPQ) - Peak replacing discharge
- (HEADVSQ) - Head versus discharge curve
- (TWCURVE) - Tailwater Rating Curve
- (CONV) - Convergence criterion for computing maximum generation
- (QGEN) - Constant maximum generation discharge
- (SLUICEQ) - Constant non-generation, non-spillway discharge

Time Series

- (LARGEBDS) - Observed number of large flashboards down
- (SMALLBDS) - Observed number of small flashboards down
- (GATE) - Observed flood gate openings
- (SLUICEQ) - Observed and projected sluice discharge

Carryover

- (DOWN) - Number of boards down for each size
- (GATE) - Gate opening